*The Ulster Medical Journal, Volume 54, No. 2, pp. 221 – 223, October 1985.*

*Case report*

# Duodenal rupture complicating childhood non-accidental injury

A Hamilton, W G Humphreys

Accepted 5th August 1985.

Duodeno-jejunal flexure injury is well recognised in blunt abdominal trauma generally. It is usually caused by compression of the relatively fixed bowel against the spine producing a shearing force which tears the bowel.[1] Non-accidental injury is a rare cause of duodeno-jejunal flexure injury in childhood, but serious complications can ensue if there is a delay in diagnosis, which unfortunately is common with this form of injury.

***Case Report.*** A three-year-old boy was admitted as an emergency, with a twenty-four hour history of lethargy, vomiting and upper abdominal pain. Shortly after admission he developed hypovolaemic shock and was immediately resuscitated. There was no sign of external trauma and on abdominal examination he had generalised peritonism. Radiographs revealed a large amount of free gas under the diaphragm and a healing fracture of the left seventh rib. His mother denied any history of trauma. It was learned later that he had been admitted twice in the last year, once with a fractured skull and cracked ribs, and again with failure to thrive and soft tissue bruising. As no adequate explanation could be found to account for the child's medical condition a case conference was called. Following this his name was put on the local 'at risk' register but this decision was later reversed at a further meeting because of improved family circumstances.

Subsequently a laparotomy was performed when gross peritonitis was found secondary to a 75 per cent circumferential tear at the duodeno-jejunal flexure. Associated with this was a three-centimetre rent in the lesser omentum not involving the structures at the free edge and a small haematoma in the right lobe of the liver. The bowel was repaired in two layers with end to end anastomosis and peritoneal lavage carried out. Post-operatively his wound burst on the tenth day and required to be sutured again, prolonging his recovery. Eventually at discharge seven weeks later he was thriving again without abdominal complaint. Shortly after his admission to hospital his father admitted assaulting him and criminal proceedings followed.

Waveney Hospital, Ballymena.
A Hamilton, MB, FRCS, Surgical Registrar.
W G Humphreys, MD, FRCS, Consultant Surgeon.

Correspondence to: Mr A Hamilton, MB, FRCS, Surgical Registrar, Waveney Hospital, Ballymena, Co. Antrim BT43 6HR.

## DISCUSSION

Over the last twenty years since Kempe[2] first described the battered child syndrome an increasing spectrum of specific injuries has been described. Soft tissue and skeletal injuries were noted initially, visceral injuries later, and most recently sexual abuse has been highlighted. In child abuse, in contrast with the pattern of visceral injury from other causes,[3] gastro-intestinal injuries are more frequent than those to solid organs.[4] There are 15 well-documented cases of small bowel perforation in association with child abuse, approximately half of which involved the duodeno-jejunal flexure region, shown in the Table.

TABLE

*Documented cases of small bowel perforation in association with child abuse*

| *Investigator* | *No. of cases* | *Sites of trauma* |
|---|---|---|
| McCort, Vaudagna[5] | 7 | duodenum + jejunum |
| Touloukian[6] | 2 | duodeno-jejunal flexure |
| Tank[7] | 1 | jejunum |
| Gornall, Ahmed, Jolleys, Cohen[4] | 1 | duodeno-jejunal flexure |
| O'Neill[8] | 1 | jejunum |
| Grosfield, Ballantine[9] | 1 | ileum + duodenum |
| Woolley, Mahour, Sloan[10] | 2 | duodenum |

Perforation in this part of the bowel is due to a shearing force produced by a sudden de-acceleration injury tearing the bowel at the anti-mesenteric border close to its point of attachment to the posterior abdominal wall.[1] In non-accidental injury the force is usually the result of a parent's punch or kick. The mortality of visceral perforation due to blunt abdominal trauma in other settings has been reported at 16-20%,[7] whereas in child abuse some small series have reported a mortality of up to 50%.[5, 6] Early diagnosis is thought to be the most significant factor in limiting mortality because surgical management is simple at this stage i.e. primary closure. The diagnosis, however, may be complicated in child abuse and consequently delayed. In the cases reported, all the children were under three years of age, precluding an independent history. Parents often delay seeking help for the child and may actually deny any trauma.[8] This means that the diagnosis is dependent on physical signs. These may be overlooked due to attention being drawn to frequently associated more obvious limb fractures and head injuries. The latter may also mask physical signs if the level of consciousness is seriously depressed.

Visceral trauma may also be the sole manifestation without evidence of external trauma. X-rays are also generally unhelpful as free gas is only found in a minority of cases.[1] Three of these features were common to this case. The recent literature suggests this to be a rare type of injury with no reliable non-invasive aid to early diagnosis. A surgeon must retain a high index or suspicion of visceral trauma in any 'at risk' child with an abdominal complaint.

**REFERENCES**

1. Haller JA. Injuries of the gastro-intestinal tract in children. Notes on recognition and management. *Clin Pediatr* 1966; **5**: 476-80.
2. Kempe CH, Silverman FN, Steele BF, Droegenmueller W, Silver HK. The battered-child syndrome. *JAMA* 1962; **181**: 17.
3. Kakos GS, Grosfeld JL, Morse TS. Small bowel injuries in children after blunt trauma. *Ann Surg* 1971; **174**: 238-41.
4. Gornall P, Ahmed S, Jolleys A, Cohen SJ. Intra-abdominal injuries in the battered baby syndrome. *Arch Dis Child* 1972; **47**: 211-14.
5. McCort J, Vaudagna J. Visceral injuries in battered children. *Radiology* 1964; **82**: 424-8.
6. Touloukian RJ. Abdominal visceral injuries in battered children. *Pediatrics* 1968; **42**: 642-6.
7. Tank ES, Eraklis AJ, Gross RE. Blunt abdominal trauma in infancy and childhood. *J Trauma* 1968; **8**: 439-48.
8. O'Neill JA, Meacham WF, Griffin PP, Sawyers JL. Patterns of injury in the battered child syndrome. *J Trauma* 1973; **13**: 332-8.
9. Grosfeld JL, Ballantine TVN. Surgical aspects of child abuse. *Pediatr Ann* 1976; **5**: 106-20.
10. Woolley MM, Mahour GH, Sloan T. Duodenal haematoma in infancy and childhood. Changing etiology and changing treatment. *Am J Surg* 1978; **136**: 8-14.